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THE REVIEW

DEVOTED TO THE INTERESTS OF THE AMERICAN SOCIETY FOR METALS

Volume XIII NOVEMBER, 1940 No. 9

J. & L. Studies Machinability By Tool Force

Two Men Talk on Machinability Tests, Alloying Additions for Free Machining

By George S. DeArment

Northwestern Pennsylvania Chapter held its October meeting at the Parish House in Titusville, on Oct. 10.

Ralph Ludwig, general superintendent of the National Forge and Ordnance Co., who acted as technical chairman, opened the meeting with some remarks on machinability. He then introduced Alexander Cruickshank, research associate of the Jones and Laughlin Steel Corp., of Pittsburgh.

Mr. Cruickshank described the results of some recent work conducted at the Jones and Laughlin laboratories in which a Schiess-Defries tool force dynamometer was used in the study of machinability.

The speaker pointed out that the force on the tool during cutting is not related in a simple manner to tool life. Tool force measurements, however, were shown to reflect the changes which take place at the tool tip during cutting, and an attempt was made to explain these changes on the basis of the behavior of the built-up edge and its relationship to tool wear.

Motion pictures were shown that clearly revealed the formation of the

(Continued on page 3)

Cincinnati Sponsors Second Radio Broadcast

By K. Siems

The second radio broadcast sponsored by the Cincinnati Chapter A.S.M. was presented on Saturday, Nov. 2, at 9:30 to 9:45 p.m. over Station WKRC, the Cincinnati Time Star Station of the Mutual Broadcasting System.

On this program Charles H. Sloan, Jr., metallurgist of the Newport Rolling Mills Division of Andrews Steel Co., Newport, Ky., was interviewed on "Twenty-Five Years of Progress in Metal".

A dinner at the Alms Hotel in honor of Mr. and Mrs. Sloan and Mr. Lin Mason, program director of WKRC, preceded the broadcast and was attended by Mr. and Mrs. M. H. Brumble, Mr. and Mrs. George H. Gerdes, Mr. H. E. Friedlein in company with Miss Helen Jackson, and Mr. and Mrs. K. Siems, chairman, vice-chairman, and executive committee members respectively of the Cincinnati Chapter.

Meet at Watervliet Arsenal

By S. L. Conner

Schenectady Chapter—The first meeting which was held at Watervliet Arsenal, New York, Sept. 17, was attended by 234 members and guests. The meeting was a great success from every point of view.

Captain Willink, Ordnance Department, U.S.A., conducted the meeting with skill and humor, and Mr. Potts of the Adirondack Foundries was a great success with his talking moving pictures.

Compliments

To J. L. Bray and J. F. Eckel of the staff of Purdue University who arranged a trip for the Indianapolis Chapter through Purdue's new $550,000 Chemical and Metallurgical Bldg.

To Maurice G. Steele, factory manager of the Kent Co., Inc., Rome, N. Y., on the inclusion of his investigation on the collapse of copper tubes in the new Design and Shop Practice volume of the eleventh edition of Kent's Mechanical Engineers' Handbook.

To S. L. Hoyt, technical adviser, Battelle Memorial Institute, Columbus, Ohio, on his excellent Campbell Memorial Lecture presented before the A.S.M. on Wednesday morning, Oct. 23, during the National Metal Congress, on "The Scientific Method in Metallurgy".

To the Texas Chapter A.S.M. on the award of the President's bell and gavel for outstanding Chapter activity during the past year, made at the Annual Meeting of the Society on Wednesday, Oct. 23.

To William Spraragen, technical secretary of the American Welding Society and editor of *The Welding Journal*, on the award of the Samuel Wylie Miller Memorial Medal of the American Welding Society, for conspicuous contributions to the art and science of welding.

To A.S.M. Trustee H. J. French and T. N. Armstrong, Jr., metallurgists with the International Nickel Co., Inc., on the award of the Lincoln Gold Medal of the American Welding Society for the paper which contributed most to the year's development of welding.

Two Student Members Give Report on Malleable

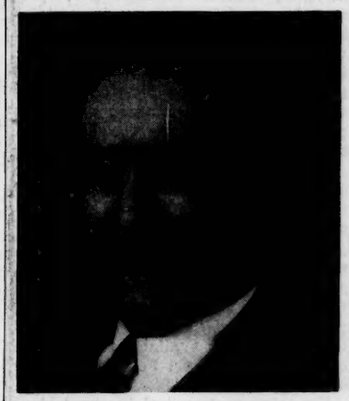
Michigan College of Mining and Technology Group held its second meeting of the year on Oct. 25, the feature attraction of which was a report on the manufacture of malleable cast iron and its many ramifications given by two student members of the organization, M. I. Isaacson and J. G. Dunleavy.

The report was the first of a series of talks to be given by various groups of metallurgical students on topics pertaining to practical problems and situations in industry. The purpose of the talks is to familiarize the students with metallurgical methods as found in practice and to correlate their studies with the various industrial problems.

The report included a discussion of the raw materials used in the production of malleable cast iron, the furnace design and operation, foundry technique and, finally, the annealing operations.

Interesting discussions interrupted the speakers on particular points of interest to the group and were competently handled by the speakers. Slides and photomicrographs were used to supplement the report.

New Head of A.S.M.



Oscar E. Harder, Assistant Director, Battelle Memorial Institute, Took Office as President of the American Society for Metals at the Annual Meeting Held in Cleveland Oct. 23 During the Metal Congress. Photographs of the other new officers appear on page 7.

PHILADELPHIA has been selected by the Board of Trustees as the location of the 23rd National Metal Congress and Exposition to be held Oct. 20 to 24, 1941.

The exposition will be held in Convention Hall and Commercial Museum, and floor plans will be mailed out in about two weeks.

Trends in Industry Discussed by Local Calumet Executives

Calumet Chapter was addressed at the dinner meeting on Oct. 16 by local industrial executives representing steel companies, oil refineries, non-ferrous industries and a public utility company. A record breaking crowd gathered to hear the speakers discuss the various phases of "Trends in Industry".

Mr. Gillies, general superintendent of the Inland Steel Co., spoke on "Trends in Management of Personnel".

He pointed out that the increased intelligence of the average laborer of today makes it necessary for foremen to possess not only superior intelligence, but the capacity for leadership. Such a combination, said Mr. Gillies, should be the aim of educators in this field.

Dean H. Mitchell, president of the Northern Indiana Public Service Co., discussed "Trends in the Government Regulation of Industry".

He outlined the increased regulation of the public utilities due to the inception of federal control in 1932. It is Mr. Mitchell's opinion that federal regulation and competition in this field is an encroachment on the rights of private enterprises.

Robert J. Black, general manager of the Sinclair Refining Co., reviewed "Trends in the Oil Industry". He pointed out that the progress made by the refineries is in great measure due to the ability of the steel companies to meet the demands of the oil research chemists for improved alloy steels.

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Metal Congress Draws 32,000 To 338 Exhibits

Theme of Production for Defense Dominates Show and Technical Meetings

With an official attendance of 32,478, with more technical sessions, meetings and activities than ever before, and with 338 exhibiting firms using 20% more space than last year, the 22nd National Metal Congress and Exposition held in Cleveland the week of Oct. 21 takes its place as the largest and finest ever held.

Based on the theme "New Aids to Production", the exhibits and meetings stressed problems of national defense.

Cooperating in the Congress and sponsoring meetings and technical sessions were the American Society for Metals, the Iron and Steel Division and Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers, the American Welding Society, and the Wire Association.

In addition to daily simultaneous technical sessions and lecture courses, the American Society for Metals held its annual meeting on Wednesday morning, Oct. 23. Retiring officers read encouraging reports of the year's activities, and new officers were installed.

Changes to the Constitution of the A.S.M. were unanimously adopted at this meeting. As printed in full in the June issue of THE REVIEW, these are merely for purposes of clarification.

The Sauveur Achievement Medal was presented to A. W. Machlet (see page 7) and the President's Bell awarded to the Texas Chapter. Charles M. Strickler was an honored guest in recognition of his ten years' service as secretary of the York Chapter.

The annual banquet of the A.S.M. swamped the Statler Hotel on Thursday, Oct. 24, with a record attendance of over 1200 who heard Gen. Hugh Johnson speak on national affairs.

A new feature of the Congress was an afternoon conference and dinner sponsored by the A.S.M., the Army Ordnance Association, and the Cleveland Ordnance District on Friday. Brig. Gen. G. M. Barnes and Maj. Gen. C. M. Wesson were the principal speakers on ordnance problems.

An unprecedented number of men

(Continued on page 6)

Dayton Hears Two Talks

By James W. Poynter

Dayton Chapter had the privilege of hearing two excellent speakers at a dinner meeting on Oct. 9.

As the coffee speaker, Miss Ella Roth described her experiences on the day war was declared as she went from Belgium into Germany to get her mother and bring her to the United States. The description of her arrest in Germany, the state of mind of the German people and her passage through the English Channel were a few of the highlights of the talk.

John E. Wiggins, metallurgist of the Nicholson File Co., gave the technical talk on "Metallurgy in the Manufacture and Use of Files". His talk is reported briefly on page 3.

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RAY T. BAYLESS.....*Editor*
M. R. HYSLOP.....*Managing Editor*

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Shows Development Of Sperry Car for Rail Defect Detection

By E. J. McKnight

Rocky Mountain Chapter "broke the ice" after a meetingless summer, on Sept. 20, with but 40 on hand to take the dive. However, the water was warm and the interest shown augurs well for the balance of the year.

Harcourt C. Drake of the Sperry Rail Service ably lectured on rail defects and their detection with the Sperry car.

The first part of the talk was mainly historical, bringing out early attempts to detect defects in rails by X-ray, Magnaflux and hammer tapping, all of which failed. Mr. Sperry then built his car on the principle of electro-flux and opened the way for modern methods of rail defect detection.

Slides illustrating various types of defects were very interesting and were followed by a color movie showing the Sperry car in action. The Sperry welding unit at work welding and laying long stretches of continuous rail on the Delaware and Hudson was the subject of another movie.

Questions and answers brought out that rail is usually laid when the weather is at a mean, to avoid a too great variation in temperature of the rail. However, the rails are anchored so securely to the ties that there is practically no movement due to expansion or contraction.

The benefits of welded rail are obviously smoother riding, less wear on ties where joints are made and fewer tie plates.

Mr. Drake repeated his lecture the next night, addressing the Pueblo Group. Ninety-three members and guests were present and the number of questions indicated a "bull's-eye".

Tri-City Hears Legge

By James C. Ericksen

Tri-City Chapter—On Tuesday evening, Oct. 8, Elmer E. Legge of the American Steel and Wire Co., Cleveland, addressed 100 members and guests at the Fort Armstrong Hotel, Rock Island, Ill., explaining "Austempering of Steel." Chairman John Graham introduced the speaker.

Mr. Legge's lecture has been reported in previous issues of THE REVIEW.

Approximately 50 members and guests attended the dinner which preceded the meeting.

Steel Foundry Movie Emphasizes Points Of Casting Design

By R. M. Garrison

Texas Chapter held the first meeting of the year at the River Oaks Country Club on the night of Oct. 10.

Immediately after the dinner, Milton Laurent, official photographer, presented a carefully edited and entertaining compilation of movies taken at various barbecues held by the Chapter in the last few years. The material showed great skill by Mr. Laurent and Chairman Wade Hampton, who compiled the pictures for the benefit of the Chapter.

Mr. Hampton called the meeting to order and introduced the members of the Executive Committee, and the various committee chairmen.

After the current business of the meeting was finished, F. M. Wittlinger, secretary of the Texas Electric Steel Castings Co., presented a sound moving picture entitled "The Design of Steel Castings", made available through the courtesy of the Steel Founders Society of America.

The picture described in simple language many of the points to be observed in the design of steel castings, and strongly emphasized the desirability of close cooperation between the designing engineer and the foundry operators to the end that better castings may be produced.

After the picture, Mr. Wittlinger requested representatives from several of the foundries in this section to answer the questions that were brought up by the membership.

Assisting in the lively discussion which ensued were Mr. Elmer of the Texas Electric Steel Castings Co., and Mr. August of the Hughes Tool Co. and several of the other foundrymen present.

The meeting started the Chapter well on the road to a successful year with 128 present at the dinner and 165 at the meeting itself.

Chicago Old-Timers Honor Founder Member; Chapter Has Monument at Grave

One of the founder members of the A.S.M., the late Arthur G. Henry, was honored recently when two old-time members of the Chicago Chapter, Frank Jeffery and Billy Williams, accompanied by Mrs. Jeffery, paid a visit to his grave in Hillside Cemetery, Genoa City, Wis.

Here on a hill commanding a wonderful view of the surrounding country, the Chicago Chapter has erected a splendid monument to his memory.

A bronze tablet on this monument gives year of birth, year of death, and a short history of his early activities in behalf of the American Society for Steel Treating, as it was known at that time.

Frank and Billy knew Arthur very well, and with Ted Barker, and other founder members, did much to create this organization. Little did they dream at that time how we were building. The rest of the story is known to those who attend A.S.M. meetings.

New England Chapters Issue Consolidated Program

For the guidance and convenience of the members of the six A.S.M. Chapters in New England, the New England Council, American Society for Metals, has issued a consolidated program and roster of officers for 1940-41.

This booklet is in addition to the yearbooks and directories of the individual groups in that region, namely, the Boston, New Haven, Hartford, Worcester, Springfield, and Rhode Island Chapters.

A somewhat similar service is performed by the Detroit Chapter which is composed of three local groups having their own meetings and officers. These are the Toledo and Saginaw Valley Groups and the main body of the Detroit Chapter.

Programs of the three groups are all printed on a small card for the convenience of the members.

Talk on Aircraft Steels Covers Standards Of Manufacture, Stresses Magnaflux Test

By F. N. Meyer

New Haven Chapter—J. A. Kearney, mill metallurgist of the Atha Works, Crucible Steel Co. of America, Harrison, N. J., gave a most interesting talk on aircraft steels and Magnaflux testing on Oct. 17.

Mr. Kearney discussed standards of manufacture, microscopic and macroscopic examination, and described in detail the magnetic examination known as Magnaflux testing.

This test has a number of advantages, such as being non-destructive, non-weakening, and adapted to final or intermediate condition, surface, or shape. Various methods of permanent recording are also available.

Flaws and discontinuities cause an abrupt change in the magnetic field which may be set up at the surface either by a current passed through it, or by an exciting coil, or external magnetic circuit.

The powder method of magnetic inspection is a special form of continuity test. It detects surface seams, subsurface defects, grinding cracks, nonmetallic inclusions.

Magnetic Powder Used

The parts to be inspected are coated with a finely divided magnetic powder, wet or dry. The wet method consists in immersing the work in the vehicle (usually a kerosene derivative) containing magnetic oxide or, preferably, in flowing the solution over the work.

The parts are then magnetized either by passing a current through them or by an external yoke. Concentrations of magnetized particles occur at disturbances of the field.

Sub-surface defects may thus be located to a certain extent, depending upon size, location, and depth beneath the surface. Cooperation of supplier and user is essential in evaluating the seriousness of the indication.

The large attendance and length of discussion period following the talk indicated clearly the keen interest shown by the Chapter and its friends in this important and timely subject.

Woodside Speaks at Syracuse Chapter Meeting

By J. R. MacAllister

Syracuse Chapter—The first meeting of the season was held on Sept. 9 at the Onondaga Hotel. Dinner was followed by a very interesting talk by W. P. Woodside, past president, A.S.M., on the "Panorama of Alloys in Steel".

The talk was presented as a brief history of the development from early crude methods of steel making through the discovery of tool steels to the introduction of alloys in structural steel.

A sound film depicted the methods used by early investigators and events giving rise to steel as we know it today.

Mr. Woodside also presented first hand information on how the A.S.M. came to be organized.

Alloy Steels & Role in Defense Kinzel's Subject

Problems Include Tools, Transportation, Plant Facilities, as Well as War Materials

By Joseph Missimer

Philadelphia Chapter—On Sept. 27 the first regular meeting of the Chapter, its traditional Educational Night, convened at Temple University to play host to the new students who had registered in the evening course in Physical Metallurgy. This year the class will be the largest in its history with 190 men enrolled.

Chairman W. J. Diederichs introduced the speaker of the evening, Dr. A. B. Kinzel, chief metallurgist, Union Carbide and Carbon Research Laboratories, Inc., who spoke on "Alloy Steels and National Defense".

The problems, said the speaker, not only entail the manufacture of munitions, war materials and war machines, but also the manufacture of additional machine tools, transportation equipment and expanded plant facilities.

The speaker discussed each element separately and spoke of the available sources of supply.

Silica Supply Plentiful

Silicon and manganese are the most important of the alloy elements in the manufacture of steel. Silica deposits are common the world over and our own supply is almost inexhaustible.

Manganese has been imported mostly from the African Gold Coast, Russia, Cuba, India, and Brazil. Russia, today, is largely unavailable as a source, but the others are supplying us with more than our immediate needs. Even in the remote event that these suppliers should be cut off, our stocks of manganese are enough to tide us over until we can develop our own deposits of low grade manganese ores.

Chromium comes principally from South Africa, New Caledonia, India, Turkey and the Philippines. Other sources are Cuba, Central and South America, Alaska, Canada, and the U. S.

It must be remembered that during the last war in 1918-19, enough chromium was mined in this country to take care of practically all of our needs at that time. Stock piles are large and are now ample for some time to come and the ore is coming in regularly at an increased rate.

Tungsten Situation Not Critical

Because nickel comes principally from Canada, we should not anticipate any trouble here. There is no shortage of molybdenum and vanadium since the chief sources for the world are in our own Rocky Mountains.

There was a serious shortage of tungsten during the last war. However, several new mines have been opened up on the West Coast since then, and increase in price brings in the marginal mines so that this time the situation is not critical.

Taking up the question "What alloys shall we use for a given job?" Dr. Kinzel said that securing an adequate supply of reliable alloy steels is no more difficult than supplying suitable "quality" carbon steels.

It is readily realized in the case of armor plate that a small difference in the ability of one alloy, over another, to stop a bullet at a given range means a lot in the amount of protection that that alloy affords.

In general, Dr. Kinzel's address was very encouraging to those who may have had some doubts as to our preparedness along these lines.

Steel Executives Head Speakers' Table at A.S.M. Banquet

A Portion of the Speakers' Table at the Annual Banquet Held in Cleveland, Oct. 24, Includes, Left to Right: W. P. Woodside, Vice-President, Climax Molybdenum Co., Past President, A.S.M.; E. J. Kulas, President, Otis Steel Co.; R. J. Wysor, President, Republic Steel Corp.; C. F. Hood, President, American Steel and Wire Co.; J. P. Gill, Chief Metallurgist, Vanadium-Alloys Steel Co., and President, A.S.M.; T. M. Girdler, Chairman of the Board, Republic Steel Corp.; O. E. Harder, Assistant Director, Battelle Memorial Institute, and President-Elect, A.S.M.; E. E. Goodwillie, Assistant to Vice-President, Bethlehem Steel Co.; Wm. E. Umstattd, President, Timken Roller Bearing Co.; Roy C. McKenna, President, Vanadium-Alloys Steel Co.; and W. Mathesius, Vice-President, U.S. Steel Corp. Among others at the speakers' table were A.S.M. Vice-President-Elect Bradley Stoughton, Secretary Eisenman, and the trustees of the Society.

6000 Varieties of Files Include Types For Brass, Stainless, Plastics, Other Uses

By R. E. Christin

Columbus Chapter—Football and files covered the subjects for discussion at the October meeting held at Pomerene Hall on the Ohio State University campus.

The coffee talk was given by a member of the Ohio State University coaching staff, J. Eddie Blickle. Intimate impressions of the team members were given clearly and informally by this close observer.

"Practical Metallurgy in the Manufacture of Files" was the unusual subject chosen for the technical portion of the meeting. John E. Wiggins, assistant superintendent, Nicholson File Co., Providence, R. I., who has been connected with his company for 40 years, stated that the first knowledge of the file can be found in the Bible.

Early files consisted of dried dogfish skins wrapped on wood sticks, small pieces of flint embedded in pieces of cassava root, and pieces of roughened flint.

England was the home of the file industry. Early file making was a family art carried on in the home. Since 1864 files have been cut successfully by machines.

There now exist about 6000 varieties, including types for brass, stainless steel, plastics, and many other purposes. The type is usually stamped on the tang end. High carbon (1.00 to 1.50%) steels are used in 99% of the files made.

Cold-drawn bars and sheets are used for the small sizes and hot-rolled bars for the large sizes. Extreme care is taken in the inspection of the raw material.

Usually ten samples are taken as representative of a shipment, and tests made for decarburization, grain size before and after hardening, and acid etch tests and microscopic tests for distribution of the carbides.

Spheroidized cementite in the microstructure has been found to give best results in service just as it gives best results in razor blades.

Steel companies are "partners" to the file industry. The steel must be properly made for the file else the quality will not be uniform.

Annealed blanks before cutting must be of uniform hardness to produce properly shaped teeth. Hardness before cutting is as important to the file maker as the final hardness.

The life of chisels employed in cutting was also discussed and the origin of the various terms denoting the type of file. After the meeting special and standard files were exhibited.

Hardenability Discussion Stresses Irregular Shapes

By R. W. Weld

Indianapolis Chapter—M. A. Grossmann, Chicago research head of Carnegie-Illinois Steel Corp., addressed the Chapter on Sept. 16, on the "Hardenability of Steels."

Dr. Grossmann's talk was well adapted to the group present and covered the salient points on comparison of hardenability tests, critical size determination and indexing, the effect of elements and grain size on hardenability, and methods of rating and determining severity of quench.

Under the direction of A. E. Focke, technical chairman for the meeting, discussion covered these points and centered on the determination of steel of proper hardenability when considered for irregular shapes.

P. B. Jensen, Indianapolis chairman, presided over the dinner and the chapter meeting which followed. There were 84 members and guests present for the dinner and meeting.

Traditional Football Game At Ann Arbor Opens the Season for Detroit Chapter

Detroit Chapter—Following a custom that has now become a tradition, the first meeting of the 1940-41 season was held in Ann Arbor on Oct. 5.

Michigan's Tom Harmon, Evashevski and Company, fresh from a decisive win over California, squeezed out a 21-14 decision over Charley Bachman's Michigan State squad. It was a great game and a thoroughly enjoyable spectacle for more than 200 A.S.M. members and their wives and friends.

Dinner was arranged at the Michigan Women's League. At the speaker's table were Leonard and Mrs. Massey, V. A. Crosby, Prof. and Mrs. James K. Pollock, Prof. and Mrs. C. W. Upthegrove, Colonel and Mrs. A. E. White, Dean Ivan C. Crawford, Past Chairman and Mrs. B. B. Beckwith, William A. Spindler of Ann Arbor, and Mr. and Mrs. Armand DiGiulio.

V. A. Crosby opened the meeting and presented Prof. Upthegrove to the audience who, in turn, introduced Prof. Crawford, recently appointed dean of the Michigan College of Engineering.

Speaker of the evening was James K. Pollock, professor of political science at the University of Michigan. His subject was "Europe Today—A Review and a Preview."

The Chapter wishes to express its appreciation to William A. Spindler, of Ann Arbor, who made the arrangements for the meeting.

Certificates Presented To Past Chairmen at Banquet and Smoker

By Jack I. Medoff

New York Chapter informally opened its fall season in the presence of metallurgical royalty on Oct. 4.

The occasion was the joint celebration of "Past Chairmen's Night" and the annual Banquet and Smoker, and the list of past chairmen and guests of honor present strongly resembles a "Who's Who" of metallurgy.

Seated at the head table with Chairman R. W. Moore were National President O. E. Harder, Past National Presidents E. C. Bain and R. M. Bird, National Trustee H. J. French and Chapter Secretary-Treasurer T. N. Holden.

Dr. Harder presented engraved certificates to the past chairmen in recognition of their service to the Chapter. They are, in the order of their service from 1919 through 1939:

Frank Fahy, W. F. Graham, G. L. Norris, P. D. Merica, Sam Tour, E. E. Thum, J. O. Rinek, Ancel St. John, Charles McKnight, F. F. Lucas, E. C. Bain, E. F. Cone, J. J. Crowe, E. M. Wise, A. B. Kinzel, J. S. Vanick, H. C. Bostwick, R. H. Aborn, L. S. Bergen, J. S. Marsh and J. W. Sands.

The Chapter also took this occasion to honor its popular secretary-treasurer T. N. Holden, who is entering his 20th year of service in that capacity.

As usual, great interest was displayed by the audience throughout the drawing for the many valuable donated prizes, leaving everyone in a receptive mood for the floor show and entertainment. The high spot of the show provided drinks on the house for the front rows by the "Magical Bartender" who poured forth, upon request, an amazing and apparently unlimited volume of varied drinks from a small tea-kettle.

Four stars plus are due Hugh Menihan, T. D. Parker and committee for their fine and efficient management of the entire affair, running a traditionally difficult job like clockwork.

Metal Cutting Is Subject

By D. J. Curtin

Mahoning Valley Chapter opened its current season on Sept. 10 with an illustrated lecture on "The Physics of Metal Cutting" by Mario Martellotti, research engineer, Cincinnati Milling Machine Co. A lively discussion followed the formal talk.

On Oct. 8 the Chapter was host to R. F. Passano, of American Rolling Mill Co., who spoke on "The Economic Use of Low-Alloy High Strength Steels". Judging from the large turnout this topic was of considerable interest to Valley members.

J. & L. Machinability Studies Described

(Continued from page 1)

built-up edge in machining. These films were taken in such a way that the work was magnified five times and the speed reduced to one fiftieth normal.

Mr. Cruickshank then showed color motion pictures of the bessemer process of making steel.

In the discussion following the lecture a question was asked regarding effect of "free machining alloy additions". Mr. Cruickshank replied that selenium, tellurium, lead, nitrogen, and phosphorus had been used successfully and more recently heavy additions of sulphur and manganese.

Mr. Ludwig then read a report of research done at the National Forge and Ordnance Co. on alloying additions for free machining. This research was done with a drill press and took into account the wear on the drilling tool.

Standard pieces were drilled to a standard depth, the load on the drill being held constant by a dead weight. The length of time taken to drill the standard depth was taken to represent relative machinability, or more precisely, "drillability".

This research revealed that the addition of 0.02% sulphur in the form of molybdenum sulphide improved the machinability of S.A.E. 4130 steel 25%.

Mr. Cruickshank answered a question regarding the effect of the built-up edge on the finishing of steel by saying that the rate of growth and decay of the built-up edge would undoubtedly affect surface finish. It was pointed out that the effect of the built-up edge in this respect could be controlled somewhat by an adjustment of cutting speed, a slight correction of tool angles, or the use of a more efficient cutting fluid.

Radio Show, Turkey Dinner Feature Halloween Dance

By K. Siems

Cincinnati Chapter sponsored its first dinner dance on Oct. 26. It was held in the Halloween-decorated ballroom of the Hotel Alms, and music was furnished by Tommy Nolan's orchestra.

Instead of the ordinary floor show, Radio Station WKRC supplied two of the coast-to-coast Mutual Broadcasting programs originating in their studios, namely, Jimmie Scribner, originator, writer, and narrator of the "Johnson Family", and a quartet "Four of a Kind".

After an old-fashioned turkey dinner, dancing started at 9:00 p.m. and lasted until 1:00 a.m. As the evening progressed the popping of balloons and din of the noisemakers resembled New Year's Eve rather than Halloween.

No Substitute For Manganese Says Archer

Describes Use in Steel of This Most Important Strategic Metal Before Tri-City Chapter

By James C. Erickson

Tri-City Chapter—R. S. Archer, chief metallurgist of the Chicago District, Republic Steel Corp., opened the new season by a thought-provoking talk entitled "Use of Manganese in Steel" at the Sept. 10th meeting held at Rock Island, Ill.

The subject was not only of general metallurgical importance, but of timely interest because of the Government's national defense program.

Manganese, the most important of our strategic metals, may increase in price, Mr. Archer stated, but this may not be caused by a shortage. Increased shipping costs may be the reason.

Functions of Manganese

Three important functions of manganese in steel are: *(a)* To improve hot rolling properties, *(b)* to improve the properties of steel in the as-rolled condition, *(c)* to improve hardenability.

Steels containing low percentages of manganese, say 0.15%, break up when rolled at temperatures between 1900° and 1600° F. as the result of hot shortness. The reason for this is not clearly known. However, it is known that steels with less than 0.01% sulphur do not involve rolling difficulties. It appears, then, that manganese removes hot shortness by combining with sulphur to form manganese sulphide.

Manganese increases the hardness and tensile strength of steels in the as-rolled condition. Deep drawing steels contain about 0.30 to 0.45% of this element, which is sufficient to eliminate hot shortness while more manganese would cause the steel to be too hard.

The hardness of plain carbon steels in the fully hardened condition depends upon the carbon content, but the ease of obtaining the desired hardness is proportional to the manganese content.

Substitutes Ineffective

There are no substitutes for manganese in steel. Both silicon and aluminum are better deoxidizers, but neither of these elements combines with sulphur in ordinary steels.

Zirconium will make the combination, but before this takes place, it will first combine with oxygen and nitrogen, thus completely deoxidizing the steel before the sulphur combination can be made. Rimming steels and semi-killed steels, therefore, could not be made.

Chromium and nickel could be used instead of manganese for the hardenability properties, but chromium is also a strategic metal, and nickel is not so effective as manganese. The best substitute for manganese in hardenability is the quenching technique itself.

Following the talk, a lively discussion testified to the general interest and the excellent coverage given by the speaker.

St. Louis Hears Martellotti

By M. M. Holtgrieve

St. Louis Chapter held a meeting on Oct. 18 in the York Hotel. An interesting coffee talk on "Television" was given by Prof. Roy S. Glasgow of Washington University, St. Louis.

The main speaker of the evening was Dr. Mario Martellotti, who is in the research department of the Cincinnati Milling Machine Co. This speaker and his subject, "Physics of Metal Cutting" drew a large and enthusiastic attendance to this meeting.

Metal Show Exhibits Interest Thousands

Part of the Crowd Studying One of the Exhibits at the National Metal Exposition Held in Cleveland the Week of Oct. 21 to 25, 1940.

Gives Functions of Steel Mill Divisions

By Francis T. McGuire

Notre Dame Chapter—The first meeting for the current season featured R. S. Archer of Republic Steel Corp. as the headliner.

A large gathering heard Mr. Archer describe the functions of the various operating divisions in a steel mill. The history of a heat of steel was carried through the open-hearth, the soaking pits, through the blooming mill down to the finished product.

Inspection, sorting, chipping and storage all were discussed along with the metallurgy department's responsibilities at each stage in the process.

The responsibility of the metallurgist doesn't end with the sale of the steel. Customers' special problems dealing with the steel must be constantly watched and continually checked.

The contact metallurgist is called upon to aid fabrication and heat treating problems of a relative and oftentimes remote nature connected with the steel.

After his lecture Mr. Archer answered questions and also discussed some of the problems that are encountered in heat treating. Distortion due to poor quenching, hard spots that caused difficulty in machining which turned out to be high speed steel particles embedded in the steel by a broken cutter were a few of the items.

Austempering Effects Are Shown At New Jersey

By Fred P. Peters

New Jersey Chapter opened its 1940-41 season on Sept. 16 with a resounding swish—the audible accompaniment to lecturer E. E. Legge's demonstration of the lethal resilience of austempered fencers' foils.

Speaking on "Austempering", Mr. Legge, assistant director of research for the American Steel & Wire Co. at Cleveland, not only discussed the technical features and operating factors in this relatively new heat treating process, but regaled the 250 Jerseymen gathered at the Essex House, Newark, with some wand-breaking experiments and an appropriately venerable anecdote about officers' swords.

Mr. Legge has lectured on austempering before other A. S. M. Chapters, and the technical part of his talk has been reported at length in previous issues of THE REVIEW.

Indianapolis Sees Purdue's New Metallurgy Building

By R. W. Weld

Indianapolis Chapter—An inspection trip to the new $550,000 Chemical and Metallurgical Building of Purdue University was made on Saturday, Oct. 19.

Under the supervision of Drs. J. L. Bray and J. F. Eckel of the Purdue staff, the members inspected the physical and chemical laboratories, fire and ore assaying equipment, rolling mills, and heat treating laboratory.

After the trip, members had dinner at the Student Union Building and then returned to the Chemical and Metallurgical Building for a sound picture on the production of stainless steel which was furnished by the Allegheny-Ludlum Steel Co.

Seventy-three A. S. M. members made the trip to Lafayette from New Castle, Anderson, Indianapolis, and Columbus, Ind.

Local Executives Talk On Industrial Trends

(Continued from page 1)

R. S. Poister, general superintendent of the Youngstown Sheet and Tube Co., read a paper on "Trends in the By-products Industry", in which he emphasized the two points that the steel companies are not only interested in the consumption of their by-products but also in converting waste products to salable material. Future development in the two fields is dependent on consumers' demand.

G. E. Johnson, general manager of the International Smelting and Refining Co., spoke on "Trends in the Non-Ferrous Metals Industry".

He enlarged on the point that future growth in this industry is dependent on the research engineer whose developments might open up new possibilities and new fields for these metals. Mr. Johnson gave the recent development of pure zinc for the die casting industry as an example of the possibilities of research.

The concluding speech of the evening was given by E. E. Moore, general superintendent of the Gary Works of the Carnegie-Illinois Steel Corp., who chose as his subject "Trends in Steel".

Mr. Moore stated that the future development and control of the steel industry is not, as is commonly believed, in the hands of technologists and industrialists, but is dependent on the desires and good will of the American people.

Shows How Alloys Are Used to Improve 5 to 9% Cr Steels

C. L. Clark of Timken Steel and Tube Is Speaker

By Philip C. Rosenthal

Milwaukee Chapter — Confining his attention to intermediate alloy steels containing 5 to 9% chromium, Dr. C. L. Clark, research metallurgical engineer for the Steel and Tube Division of the Timken Roller Bearing Co., presented an enlightening discussion before the Oct. 15th meeting.

Dr. Clark systematically considered the properties and applications of these steels and then showed how alloys are used to obtain the desired results.

He classified the alloys into solid solution or carbide formers and ferrite or austenite formers, and discussed the utilization of these tendencies in producing a steel for a definite service. Generally speaking, the solid solution type is most effective in improving surface stability, whereas the carbide formers aid the strength properties.

Beginning with the plain 4 to 6% chromium steels, Dr. Clark outlined the improvement resulting by adding molybdenum to decrease temper brittleness and silicon and aluminum to improve corrosion resistance.

The 6 to 8% and 8 to 10% steels were considered in the same manner. With these steels, Dr. Clark pointed out that the increase in chromium requires lower silicon and molybdenum to keep them out of the two-phase, alpha plus gamma, region.

He showed that maximum creep strength of these steels does not increase proportionately with chromium but that the higher alloy content promotes surface stability. The 100,000-hr. rupture strength increases with chromium and molybdenum.

In any application of intermediate alloy steels to service at elevated temperatures, Dr. Clark said it was necessary to consider all factors involved, since a steel designed for one condition of temperature, load or corrosion very likely may not be satisfactory under other conditions. Thus with a knowledge of the properties contributed by the various alloy additions, the optimum composition can be chosen for the service intended.

During the dinner hour, Dr. Ross H. Bardell, assistant professor of mathematics at the University of Wisconsin Extension Division and local director of the CAA programs, described the achievements and shortcomings of the Civil Aeronautics program in the locality and nationally.

National President and Secretary Talk at Ontario

By J. W. McBean

Ontario Chapter was fortunate in having for the first meeting on Oct. 4 both the president and national secretary present. The Executive Council, who were their guests at luncheon, were much interested in a free discussion of the Society's affairs before going to the evening meeting at Hamilton.

Mr. Eisenman had to leave the Hamilton meeting a little early to catch his train, but after the dinner he gave in his inimitable style an informal talk to the members and guests.

Mr. Gill's paper on "Recent Developments in Tool Steel" has been reported previously in THE REVIEW, but the interest in it was keen. A great many members were ready to put Mr. Gill through the "works" with a barrage of questions but he answered all of them without any hesitation.

25 Chapters Announce Season's Educational Courses

Cross-Section Shows Variety of Subjects And Types Planned

More than half of the 51 A.S.M. Chapters have already announced plans for educational activities of various types during the current season, and many others have plans partially completed.

Many of these activities are based on courses available in printed form and accompanied by lantern slides supplied by the National Office of the A.S.M. The complete list of these courses is as follows:

Functions of the Alloying Elements in Steel, by E. C. Bain
Modern Steels
Metals—How They Behave in Service
Machining of Metals
Open-Hearth Steel Making, by Earnshaw Cook
Physical Testing of Metals, by H. D. Churchill
Tool Steels, by J. P. Gill
Principles of Heat Treatment, by M. A. Grossmann
Fundamentals of Ferrous Metallurgy, by A. Allan Bates

A cross-section of the programs so far planned is shown below.

CALUMET CHAPTER

Series I—Welding

Oct. 30—Gas Welding; W. B. Browning, Linde Air Products Co.
Nov. 6—Arc Welding; W. B. Horton, Lincoln Electric Co.
Nov. 13—Pressure Welding; T. McLean Jasper, A. O. Smith Corp.

Series II—Protective Coatings

Lecturer—E. D. Martin, Inland Steel Co.

Jan. 22—Hot Dipped Coatings.
Jan. 29—Electrolytic Coatings.
Feb. 5—Resinous Coatings.

Series III—Spectrographic Analysis

Lecturer—A. M. Sampson, Campbell, Wyant & Cannon Foundry Co.

Mar. 26—Fundamentals of Spectrography.
Apr. 2—Spectrographic Operations.
Apr. 9—Interpretation of Spectrograph.

CHICAGO CHAPTER

Fundamental Series

Nov. 4—Raw Materials for Iron and Steel Manufacture; J. J. Golden, Supt. Steel Prod., Carnegie-Illinois Steel Corp.
Nov. 18—Steel Manufacture; H. L. Geiger, Chicago Rep., International Nickel Co.
Dec. 2—Application and Use of Steel; H. L. Geiger.
Jan. 20—Manufacture of Tool Steels; A. J. Scheid, Jr., Supt. of Melting, Columbia Tool Steel Co.
Feb. 3—Selection and Use of Tool Steels; A. J. Scheid, Jr.
Feb. 17—Metallurgy of Automotive Bearing Steels; A. S. Jameson, Metallurgist, West Pullman Works, International Harvester Co.
Mar. 3—Metallurgy of Screw Machine Steels; A. S. Jameson.
Mar. 17—Copper and Alloys Fundamentals; D. R. Howerton, Metallurgical Engineer, Western Electric Co.
Mar. 31—Copper Alloys Manufacture and Uses; D. R. Howerton.
Inspection Trip to Crane Co.—Details later.

Metallurgical Seminar

Sept. 23—Metallurgical Testing; Various Leaders.
Nov. 11—Corrosion; E. H. Dix, Jr., Chief Metallurgist, Aluminum Research Laboratories.
Feb. 24—Bearings and Bearing Metals; E. R. Darby, Metallurgist, Federal Mogul Corp.
Mar. 24—Isothermal Transformation in Steels; E. S. Davenport, Metallurgist, U. S. Steel Corp. Research Laboratory.

CINCINNATI CHAPTER

The practice of holding monthly discussion meetings for groups of members whose interest centers on a certain subject is continued. A new "General Metallurgy Group" is organized this year for those members whose training has been in other fields than metallurgy.

University of Cincinnati also sponsors evening courses in metallurgy, heat treating and welding for members of the American Society for Metals and their employees.

CLEVELAND CHAPTER

Course No. 19

Patent Law in the Field of Metallurgy

Lecturer—Thos. J. Doran, Hyde & Meyer Co.

Dates—Nov. 18 and Nov. 25.

Course No. 20

Steel Manufacture & Mill Practice

Lecturer—Gerald M. Cover, Case School of Applied Science.

Jan. 20—Pig Iron Production.
Jan. 27—Steel Making Processes—General.
Feb. 17—Steel Making — The Basic Open Hearth.
Feb. 24—The Steel Ingot—Defects.

Course No. 21

High Temperature Properties of Metals

Lecturer—Howard C. Cross, Battelle Memorial Institute.

Dates—Mar. 17 and 24

DETROIT CHAPTER

A course of lectures on **Metallurgical Inspection and Testing** is designed especially for Government inspectors and all manufacturers of Government materials.

Nov. 7—The Manufacture of Steel and Steel Mill Inspection; L. L. Ferrall, Chief Metallurgist, Rotary Electric Steel Co.
Nov. 12—Mechanical Testing—Tensile Properties, Testing Methods; H. H. Zurburg, Physicist, Chrysler Engineering Laboratories.
Nov. 14—Mechanical Testing—Testing Equipment; J. L. McCloud, Metallurgist, Ford Motor Co.
Nov. 19—Mechanical Testing—Hardness and Impact; W. E. Jominy, Research Metallurgist, General Motors Corp.
Nov. 26—Brass and Bronze—Manufacture, Fabrication, Testing; C. Upthegrove, University of Michigan.
Nov. 28—Aluminum — Manufacture, Fabrication, Testing.
Dec. 3—Castings, Steel — Manufacture and Testing; J. D. Corfield, Vice-President, Michigan Steel Castings Co.
Dec. 5—Castings—Gray Iron, Malleable Iron, Manufacture and Testing; Richard Schneidewind, University of Michigan.
Dec. 10—Macroscopic Examination—Forgings, Flow Lines, Defects; L. A. Danse, Metallurgist, Cadillac Motor Car Co.
Dec. 12—Government Specifications.

LOS ANGELES CHAPTER

Five lectures on **Physical Testing and Its Interpretation** are planned covering tensile, fatigue, hardness, bend and torsion testing.

MILWAUKEE CHAPTER

Surface Treatments

Nov. 4—Hot Dip Coatings; John R. Daesen, Consulting Metallurgist.
Nov. 11—Protective Coatings (Paints and Lacquers); P. H. Wiegand, Research Engineer, Paint Division of Pittsburgh Plate Glass Co.
Nov. 18—What the Metallurgist Should Know About Plating; P. J. Ritzenthaler, Electro Chemist, Cutler-Hammer, Inc.
Nov. 25—Principles of Carburization; R. A. Ragatz, Professor of Metallurgy, University of Wisconsin.
Dec. 2—Porcelain Enamel for Corrosion Problems; W. W. Higgens, Director of Ceramics, A. O. Smith Corp.

MONTREAL CHAPTER

Machining of Metals

Jan. 14—Physics of Metal Cutting; E. C. Winsborrow, Canadian Car & Foundry Co., Ltd.
Jan. 21—Machinability of Ingot Iron, Wrought Iron, S.A.E. Steels and Stainless Steels; D. V. Hamilton, Canadian Tube and Steel Products, Ltd.
Jan. 28—Some Factors Affecting the Machinability of Cast Steel, Cast Iron and Malleable Iron; G. E. Tait, Dominion Engineering Works, Ltd.
Feb. 4—Machinability of Tool Steels; G. Sproule, McGill University.
Feb. 11—Machining of Non-Ferrous Metals; B. Collitt, Jenkins Bros., Ltd.

MUNCIE CHAPTER

Educational courses in metallurgy have been started in the night schools of Anderson, New Castle and Muncie under the sponsorship of this Chapter.

NEW HAVEN CHAPTER

Metallurgical Investigations of Service Failures (or How to Be a Metallurgical Detective) is the subject of six lectures being presented by R. M. Brick of Yale University.

Oct. 28—Was the Proper Metal or Alloy Selected for the Specific Service?
Nov. 4—Did the Metal Composition, Alloy and Impurity, Conform to Specifications and Were These Adequate?
Nov. 11—Can the Failure Be Traced to Improper Melting Practice?
Nov. 18—Was the Casting, Rolling or Forming Procedure at Fault?
Nov. 25—How About the Heat Treatment?
Dec. 2—Were Unusual Service Conditions: Vibration, Corrosion, Etc., Encountered?

NEW YORK CHAPTER

Heat Treatment of Steel

Nov. 12—Direct Hardening; Lewis S. Bergen, Metallurgist, Crucible Steel Co. of America.
Nov. 19—Case Hardening; John F. Wyzalek, Chief Metallurgist, Hyatt Bearings Division, General Motors Corp.
Nov. 26—Surface Hardening (Electric Induction Method); W. E. Benninghoff, Tocco Division Manager, The Ohio Crankshaft Co.
Dec. 3—Surface Hardening (Flame Hardening Method); A. K. Seemann, Engineer, The Linde Air Products Co.
Dec. 10—Hot Quench Hardening; E. E. Legge, Assistant Director of Research, American Steel & Wire Co.

NOTRE DAME CHAPTER

A series of lectures on **Scientific Fundamentals of Metallurgy** by Prof. E. G. Mahin, University of Notre Dame, is being planned under the joint sponsorship of the Michiana Chapter, American Foundrymen's Association, and the Notre Dame Chapter A.S.M.

ONTARIO CHAPTER

A course on **Engineering Materials and Processes**, designed primarily for men who have recently entered industrial activities, has been tentatively outlined as follows:

1a. Introductory Talk—The Handbook, Its Contents and How to Use It; L. F. Fitzpatrick.
1b. The Mechanical and Physical Properties of Steels, as Influenced by Composition and Treatment; J. Millson.
2. Practical Tool Hardening and Tempering; R. B. Stewart.
3. The S.A.E. Steels; H. B. Chambers.
4. The Mechanical Testing of Metals and Alloys; C. Tasker.
5. The Physical Testing of Metals and Alloys; G. Willey.
6. Aluminum and Aluminum-Base Alloys; N. E. Russell.
7. Copper and Copper-Base Alloys; O. W. Ellis.
8. Nickel and Nickel-Base Alloys; K. H. J. Clarke.
9. The Fundamentals of Machining; K. L. Morris.
10. Welding as an Industrial Tool; H. Thomasson.

PEORIA CHAPTER

Sponsored jointly with the University of Illinois, **The Principles of Metallography** is being delivered by Harold L. Walker, Acting Head of the Department of Mining and Metallurgical Engineering, University of Illinois.

Sept. 30—States of Aggregation.
Oct. 7—Physics of Metals.
Oct. 21—Working and Annealing of Metals.
Oct. 28—Structures of Binary Alloys.
Nov. 4—Reactions in Homogeneous Alloys.
Nov. 18—Non-Equilibrium Conditions in Binary Alloys.

PHILADELPHIA CHAPTER

The course in Metallurgical Inspection for Government inspectors held during September was reported in the October issue of THE REVIEW. In addition, Temple University continues to cooperate with the Philadelphia Chapter in offering a "Practical Evening Course in Heat Treatment and Metallography of Steel." This comprises a one-year elementary course, with an advance course leading to a certificate in metallurgy.

The six-lecture evening course is on **Factors Affecting Heat Treatment—Modern Viewpoints:**

Feb. 12—What Happens Upon Heating Steel; Adolph O. Schaefer, Midvale Co.
Mar. 7—What Happens Upon Cooling Steel; James R. Adams, Midvale Co.
Mar. 21—What Happens Upon Cooling Steel (Continued); A. W. Grosvenor, Drexel Institute.
Apr. 4—What Happens Upon Tempering Steel; Francis B. Foley, Midvale Co.
Apr. 30—Grain Size; L. E. Ekholm, Alan Wood Steel Co.
May 16—Hardness and Hardenability; Franklin H. Pennell, DeLaval Steam Turbine Co.

PITTSBURGH CHAPTER

Sept. 24—A General Discussion of Deep Etch Testing; Robert W. Frank, Carnegie-Illinois Steel Corp.
Oct. 29—Stainless Clad Steel; T. S. Fitch, Jessop Steel Co.
Nov. 19—Metallurgical Patents; Walter J. Blenko, Stebbins & Blenko.
Jan. 28—Evaluation of Alloyed Elements in Steel; V. N. Krivobok, Allegheny-Ludlum Steel Corp.
Feb. 25—Developments in Bessemer Steel; C. C. Henning, Jones & Laughlin Steel Corp.
Mar. 25—Significance of Creep; P. G. McVetty, Westinghouse Electric & Mfg. Co.
Apr. 22—Latest Developments in Open Hearth Practice; D. L. McBride, Bethlehem Steel Co.

ROCHESTER CHAPTER

A series of lectures devoted more specifically to practice is based on the Metals Handbook.

Sept. 30—Tool Steels.
Oct. 7—Failures as Related to Structure.
Oct. 28—Corrosion as Related to Structure.
Nov. 4—Season Cracking.
Nov. 18—Interpretation of Hardness Tests and Numbers.
Nov. 25—Definitions and Terms.
Dec. 2—Discussion of Grain Size Designation.
Dec. 16—General Discussion of Metals Handbook.
Jan. 6—Macro Examination.
Jan. 20—Shrinkage in Castings.
Jan. 27—Precipitation Hardening.
Feb. 3—Selective Hardening.
Feb. 17—How Design May Be Affected by Physical Properties.
Feb. 24—How Design May Be Affected by Choice of Materials.
Mar. 3—Application of the Above to Specific Cases.
Mar. 17—Specific Cases.
Mar. 24—Choice of Material for and Design of Flat Springs.
Mar. 31—Problems in the Use of Sheet Metal.
Apr. 7—Machinability Problems.
Apr. 21—Machinability Problems.

ROCKFORD CHAPTER

Seven lectures covering metallography and heat treatment of steel will be given by C. R. Wiggins of the Northwestern Steel & Wire Co., starting Jan. 7.

ROCKY MOUNTAIN GROUP

A series of lectures on fundamentals of metallurgy, testing, and metallography is being given every Tuesday. Floyd Anderson of the Denver Rock Drill Co. is in charge of the ferrous division, and Wayne Parcel of the Denver & Rio Grande Western Railroad, and George Kincaid of Magnus Metal Co. in charge of the non-ferrous.

SCHENECTADY CHAPTER

Basic Elements of Metallurgy

Oct. 10—Iron and Steel Throughout the Ages, T. Holland Nelson.
Oct. 28—Iron and Carbon.
Nov. 18—Effect of Manganese, Phosphorus, Sulphur, Silicon.
Dec. 2—Effect of Nickel, Chromium, Molybdenum, Vanadium.

ST. LOUIS CHAPTER

A course on **Machining of Metals** is planned.

SYRACUSE CHAPTER

Steel Metallurgy for National Defense

Oct. 17—Non-Destructive Testing Methods; L. S. Fulton, Crucible Steel Co. of America.
Oct. 24—Selection and Treatment of Tool and Die Steels; H. J. Stagg, Jr., Crucible Steel Co. of America.
Oct. 31—Manufacture and Uses of Gear Forming Tools; G. H. Sanborn, Fellows Gear Shaper Co.
Nov. 7—Non-Destructive Testing Methods (X-Rays); C. T. Patterson, Solvay Process Co.
Nov. 14—Stainless Steel; Speaker from Allegheny Ludlum Steel Corp.
Nov. 28—Metallurgical Information Please; Chairman—J. Brace, Jr., Brace-Mueller-Huntley, Inc.

TEXAS CHAPTER

The Bates course on "Fundamentals of Ferrous Metallurgy" is being repeated by popular demand for the benefit of those who were not able to take it last year. Instructors are Alex Vallance of Reed Roller Bit Co. and Chas. F. Lewis of Cook Heat Treating Corp.

It is contemplated that an advanced course will be offered in the spring.

TRI-CITY CHAPTER

Selection of Steel for Manufacturing Applications will be presented by Gordon T. Williams of Deere & Co.

Jan. 21—Significant Mechanical Properties of Steel.
Jan. 28—Significant Metallurgical Properties of Steel.
Feb. 4—Properties of Steel as Purchased.
Feb. 18—Properties of Heat Treated Steels.
Feb. 25—Case-Hardening Steels.
Mar. 4—Considerations in Fabrication.
Mar. 18—Economics of Steel Selection.
Mar. 25—Selection of Steel by Problem Analysis.

WORCESTER CHAPTER

A practical evening course on the Fundamentals of Shaping, Treating, and Behavior of Metals and Alloys sponsored by the Chapter is held at Worcester Polytechnic Institute. Classes began Oct. 21, continuing every Monday and Wednesday evenings for 12 weeks. Charge is $15.00.

1920-1940 Tool Steel Evolution Compared To Changes in Autos

By D. M. Horner

York Chapter—New Chapter Chairman Harry Hovis and newly elected and appointed officers and committees inaugurated the new technical year auspiciously on Sept. 11 when National President J. P. Gill enlightened and summarized on "Recent Developments in Tool Steels". Newly elected officers included York's perennial secretary-treasurer Charles M. Strickler, now starting his 11th consecutive year of devoted efficiency.

President Gill compared lantern slides of a 1920 automobile with its 1940 successor, and warned that tool steel developments and changes were not as rapid or radical.

The speaker went on to compare 1920 and 1940 methods of production and quality control; discussed improvements in heating, annealing, and heat treating furnaces; and outlined the increased use of alloys in tool steels over this period with particular reference to nickel, silicon, and molybdenum which were not used in any tool steel in 1920.

After consideration of the many improvements in fabricating a finished tool made in the last 20 years, it became apparent that both the 1920 model tool steel and finished tool are outmoded just about as badly as the 1920 automobile, in spite of President Gill's modest statement to the contrary.

File Industry Shown From Biblical Time to Present

By K. Siems

Cincinnati Chapter's monthly dinner meeting was held Thursday, Oct. 10, at the Alms Hotel.

Maj. Norman of the 10th Infantry, Ft. Thomas, Ky., who but recently returned from the Philippine Islands, entertained with an excellent talk on some of his experiences during a six-year sojourn on these islands.

John E. Wiggins, assistant superintendent of the Nicholson File Co. of Providence, R. I., then lectured on "The Manufacture and Application of Files". In spite of his statement that he was a shop man and not a lecturer, he turned out to be one of the most fluent and enthusiastic speakers it has ever been the pleasure of the Cincinnati Chapter to hear.

Mr. Wiggins' talk, which is reported in another part of this paper, was augmented by a series of slides depicting various phases of the file industry from Biblical times up to the present.

Principles of Static Load Are Related to Truck Metallurgy

By J. T. Ballard

Hartford Chapter started its 1940-41 season on Oct. 8, with a dinner at the Hartford City Club immediately followed by a bang-up good coffee talk by H. H. Harris of General Alloys Co., Boston.

The subject matter was of especial interest metallurgically as well as artistically—namely, casting of the world's largest stainless steel plaque for the new Associated Press Building in Rockefeller Center, New York City.

The group then repaired to the assembly hall of the Hartford Gas Co. to hear a mighty interesting talk on the application and handling of metals for the truck industry by William J. Diedericks, metallurgist of the Autocar Co. of Ardmore, Pa. His subject was "The Behavior of Metals Under Static Load".

Starting with the more elemental principles of the effects of stresses and strains in steel, Mr. Diedericks led his listeners through to the basic reasons behind the engineer's choice of certain types of metals to handle the various rugged jobs required of automotive parts.

Jimmy Allison of Billings & Spencer Co. was technical chairman.

Previous to the main talk, Dave Nemser of the International Nickel Co. spoke briefly about the National Metal Congress and announced final arrangements for making up a car of Hartford members. Actually more than 20 of the Hartford clan made the trek.

PRE-PUBLICATION PRICE FOR MEMBERS ONLY!

GENERAL INDEX

TO TRANSACTIONS AND METAL PROGRESS

Part III—1933-1939

This helpful volume—containing breakdown by author and subject matter (cross-indexed) of all editorial material appearing in Transactions and Metal Progress during the years 1933 through 1939—is available to ASM members at the special Pre-Publication price of $1.00 until January 1st, 1941. After this date the volume will sell for $3.00—so order your copy today. You'll refer to this book constantly in your technical readings.

COMPLETE INDEX 1920-1939 NOW AVAILABLE IN ONE VOLUME AT SPECIAL SAVINGS

Every paper, article and editorial printed in Transactions and Metal Progress from 1920 through 1939 is indexed in one volume which will be bound shortly. This Complete Index is available to ASM members at the special price of $2.00 until January 1st, 1941—after which date it will sell for $4.00.

This volume is divided in three sections: Part I 1920-26, Part II 1927-32, and the new section, Part III 1933-39. The supply of printed sections for Part I is limited, and the Complete Index will be available only as long as these last. If you do not already have Parts I and II, order the Complete Index now at this special price.

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Small Additions Cause Variations in Al Bronze

By Alan Mattison

Rockford Chapter's second meeting featured "Aluminum Bronze Alloys" and was sponsored by Ampco Metal.

J. D. Zaiser, assistant general manager, spoke of the physical properties of these alloys and of the variations that can be caused by slight additions of various metals both in the physical properties and the microstructure and their resultant effect on commercial application.

A sound movie depicting a trip through the Ampco Metal plant was presented. This covered all the various operations from the receipt of raw material to the finish machining of castings.

Talk on Firearms Is Feature of "Ice-Breaker"

By J. M. Gotshall

Canton-Massillon Chapter's "Ice Breaker" meeting was held on Oct. 17 at the Elks Club in Canton, Ohio.

The new officers were introduced to the gathering of 150 members and guests and short talks were heard.

The principal speaker of the evening was Terry W. Brown, manager of the Canton office of the East Ohio Gas Co. and president of the Ohio Gun Collectors Association. His subject was "Firearms Old and New". A very pleasant three quarters of an hour was spent in listening to this talk, a detailed explanation of the use and development of firearms with special emphasis on U. S. Army weapons of the smaller caliber types.

This was followed by a buffet lunch, cards, etc., which satisfactorily terminated a well-organized and interesting program.

Harder Continues R. I. President-Elect Tradition

By Walter M. Saunders, Jr.

Rhode Island Chapter began the year's activities auspiciously on Oct. 2, when Dr. Oscar E. Harder, assistant director, Battelle Memorial Institute, journeyed to Providence to address the chapter on "The Effect of Lead on Steels".

This marks the third successive year that Rhode Island has been honored by a visit from the president-elect of the Society, and in the future, Rhode Island promises to vote for any candidate for president who will continue this tradition, and will vote twice for the man who induces Bill Eisenman to accompany him.

Since Dr. Harder's talk will be presented before many more of the Chapters during coming months, it will not be reviewed here.

The Coca-Cola Bottling Company of Rhode Island furnished the coffee speaker at the dinner preceding the meeting in the form of a movie entitled "Refreshments through the Years", and afterwards treated each member to "a pause that refreshes".

Metal Show Draws 32,000

(Continued from page 1)

gathered Wednesday noon for 14 alumni luncheons, following the annual meeting and Campbell Memorial Lecture.

Also included in a full week of activities were the Canadian Luncheon, Rochester Dinner, Chapter Chairmen's Breakfast and daily Speakers' Breakfasts, the Cleveland Advertising Club Luncheon at which A.S.M. Past President A. E. White of University of Michigan was the principal speaker, and an unusually interesting program of activities for the ladies.

Design of Guns Differs From Other Products

Based on a Single Set of Conditions, Jenks Explains in Ordnance Talk

By George E. Burkhardt

Rochester Chapter—Col. G. F. Jenks of the Ordnance Department, U. S. Army, spoke at the first meeting of the season on "Construction Metals used in Ordnance".

Col. Jenks explained that industrial products are designed to resist stresses under varying conditions for long periods of time but gun designs are based on a single set of conditions; namely, deformation for a relatively few applications of stress.

Guns in general are not designed to resist fatigue although in modern mechanized guns fatigue failures have been experienced, particularly in running gear. Ordnance materials may be subject to stresses within the plastic range; this is especially true of armor plate.

Throughout the ordnance field it is highly necessary to use materials of good machinability for maximum producibility. For materials difficult to machine it is attempted to get the material distributed in the hot stage (by forging, etc.) so that a minimum amount of machinability is necessary.

Flakes Are Worst Offenders

Large guns of today are made by several methods, one of which is to shrink several concentric cylinders together, each cylinder being shrunk on the preceding one. Another method is the single forging or casting called the autofrettage method. This method requires forgings or castings of the highest quality.

Colonel Jenks showed a series of slides of gun forging cross-sections that had been macro-etched to show inclusions, flakes, etc. Flakes seem to be the worst offenders and any sections showing the presence of these "practical producers of stress" are rejected.

One of the greatest problems of the Ordnance Department is to minimize or prevent the erosion of gun barrels due to "firing". The charges exploding create high temperatures within the barrel with accompanying high pressures.

Microstructures were shown of the inner surfaces of gun barrels that had developed heat checks. Continued firing increases the size of these checks and sizable pieces are dislodged, resulting in severe erosion.

White Layer Not Identified

Microstructures of this inner barrel condition show a white layer outlining the heat checks. The composition of this white layer is not definitely known, although it is probably either carbide or nitride or both. A great service would be done for the Ordnance Department if this condition could be prevented and when the nature of the white layer surrounding these heat checks is understood this may come to pass.

Castings and welded structures are being used more and more in ordnance equipment as the knowledge of heat treatment and welding practice is increased. For instance, cast armor plate, when properly cast and heat treated, is almost as good as rolled plate of the same composition.

The coffee talker at this meeting was Capt. Ward L. Hamilton, Coast Artillery Corps, Anti-Aircraft Div., who spoke on "Military Matters". Ward is connected with the Ritter Dental Co. of this city.

Classification of Tool Steels According to Analysis & Use Given

By J. F. Hakes

Baltimore Chapter—As a new feature of the first regular monthly dinner meeting on Oct. 21, a discussion leader was provided to stimulate interest in the talk and to bring out points of interest in the discussion.

H. E. Replogle of the Crucible Steel Co. of America was the speaker, and his subject was "Tool Steels, Their Application and Heat Treatment". The talk was accompanied by a moving picture showing the process of manufacture at the Crucible mills.

Mr. Replogle is a graduate of Colgate University, and has been connected with Crucible since 1929. During the last four years he has devoted his time to special field work on tool and high speed steels.

Of particular interest in his discussion was the classification of tool steels according to their analyses and purposes for which they are used. This is a subject that has long been confusing to the trade and any movement along this line would be of great help.

The speaker also discussed the subject of multiple draws for high speed steel, particularly stressing the point that even if the same time for the draw is used, dividing this time into two draws is preferable; that is, two 1-hr. draws would be better than one 2-hr. draw. In some cases, three and even four draws are being used to advantage.

Refreshments were served following the talk, and the Chapter then enjoyed a travelogue furnished by the Ford Motor Co.

Golf Holds First Interest At Boston Chapter Outing

By R. G. Sault

Boston Chapter held its annual outing at the Stow Country Club in Stow, Mass., Sept. 14.

Approximately 200 members and guests attended this annual event which included various forms of exercise, ranging all the way from the violent to the profane.

Golf held first place but was closely followed by soft ball, as was evident from the number of prizes awarded.

The number of prizes contributed was beyond expectations so that very few went away disappointed. The collection and distribution of the prizes was in charge of George Burnett, who handled the affair with his usual efficiency and geniality.

Chief credit for success of the annual outing goes to Paul Ffield as chairman, ably assisted by his co-chairmen.

Grossmann Gives Clear Picture of Heat Treating

By H. R. Willmott

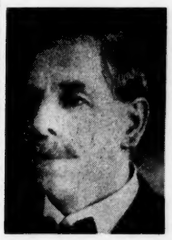
Montreal Chapter opened its 1940-41 season on Oct. 7 with an address by M. A. Grossmann, director of research, Carnegie-Illinois Steel Corp. This eminent metallurgist and capable lecturer gave Montrealers a very clear picture of the "Principles of Heat Treatment".

This talk, which describes a simple method for evaluating hardenability of a steel, has been reported in previous issues of THE REVIEW.

The lecture was preceded by a dinner at which a number of sustaining members were guests of the Chapter. The dinner was followed by a motion picture film entitled "Triangular Tours". This much appreciated film was exhibited by the courtesy of E. C. Elliott, general passenger agent, Canadian National Railways.

HERE AND THERE WITH A.S.M. MEMBERS

SIXTH of the "metallurgical pioneers" to be honored with the Sauveur Achievement Award of the American Society for Metals is ADOLPH W. MACHLET, president of the American Gas Furnace Co., Elizabeth, N. J.



A. W. Machlet

Based on the stipulation that the recipient must have so stimulated organized work that a marked basic advance has been made in metallurgical knowledge, the medal is awarded each year during the National Metal Congress. Although Mr. Machlet was unable to be present in person, the presentation on Oct. 23 preceded by one day his 76th birthday.

Mr. Machlet has spent his entire career with American Gas Furnace Co., of which his father was co-founder. His pioneering metallurgical achievements include invention of a direct gas carburizing process and machine which have measurably cheapened and bettered the casehardening process; basic work in developing the nitriding process; the development of the so-called Carbonia or gun metal process; the rotary gas carburizing machine; and the Ni-Carb process.

One of his latest developments is a superior method for the clean hardening of carbon and high speed steels.

* * *

A. W. SIKES, past chairman, Chicago Chapter, has been called from his position as materials engineer, Bureau of Engineering, City of Chicago, to active duty for an indefinite period with the U. S. Army.

Captain Sikes, who served with the Army in 1917-18 and has held a reserve commission in the Chemical Warfare Service for many years, is now stationed with the Chemical Officer of the Sixth Corps Area with headquarters in Chicago. He will primarily be concerned with plans for training selective service men of this area in defense against chemical attack.

Harris's "Tree Oysters", Stainless Plaque and Photography Fill Evening

By Charles A. Nagler

North West Chapter opened the 1940-41 season on Sept. 19, with H. H. Harris, president of General Alloys Co., Boston, as speaker for the evening.

Previous to the meeting a Smorgasbord dinner was given in Mr. Harris's honor, after which he produced two kilograms of African Tree Oysters, and distributed the same among the men who were in the audience. He then described the merits of this fancy African fruit—and incidentally was very amusing and entertaining.

Mr. Harris's talk on "Heat Resistant Alloys" was well illustrated by some 100 slides and included the production of the Associated Press Plaque which is the largest casting of its type ever to be made. Time was also devoted to describing slides of the "Endeavor Boat Race" off Long Island, Notre Dame winning the speed boat heat at Detroit, aero-photographs of many industrial plants, and of the heart of New York City, and odd land formations.

The discussion at the close of the talk was centered about application of various compositions of the basic nickel-chromium variety for service at high temperatures. About 60 members attended.

New A.S.M. Officers

Bradley Stoughton

W. H. Eisenman

C. Y. Clayton

E. L. Bartholomew

Bradley Stoughton, Dean Emeritus, Lehigh University, Is the New Vice-President of the American Society for Metals; W. H. Eisenman Has Been Re-elected Secretary; Two New Trustees Are Charles Y. Clayton, Professor of Met. Engineering, Missouri School of Mines, and E. L. Bartholomew, Metallurgist, United Shoe Machinery Corp.

Higher Machining Speed Possible With Use of New Carbide

By D. M. Horner

York Chapter made its annual trek to Waynesboro on Oct. 9 when Harry Horner and his committee and the rest of the Waynesboro contingent of the York Chapter were hosts for its meeting at the Anthony Wayne Hotel. As usual, the Waynesboro meeting drew a large crowd.

The committee, among other things, had the beautiful Blue Ridge Mountains properly bedecked in the latest thing in autumn foliage for the admiration of the visitors, and also provided plenty of Waynesboro's famous apples for everyone.

After an excellent dinner, Program Chairman A. J. Kleinert introduced Philip McKenna, general partner of the McKenna Metals Co., who gave a very interesting talk on "New Hard Compositions for Steel Cutting Tools".

Mr. McKenna discussed the development of cemented carbide tools with particular reference to the relatively new carbide now manufactured by his company under the trade name of Kennametal, which is a true chemical compound, $WTiC_2$, of great purity.

Mr. McKenna explained the processes involved in the manufacture of this material and told of its advantages over some other types of cemented carbides.

The very high machining speeds possible, its use on interrupted cuts and cuts of varying depth, and the very hard materials which it will cut satisfactorily made the lantern slides and moving pictures illustrating these features of especial interest.

Position Wanted

METALLURGIST: B. Sc. University of Glasgow; has studied at University of Perugia, Italy, and Brussels, Belgium; age 25. Two years experience in research laboratory of Brown, Bayley's Steel Works, Sheffield, England. Interested in teaching or research. Box 11-5, American Society for Metals, 7301 Euclid Ave., Cleveland, Ohio.

THOMAS J. MOORE, a past chairman of the Philadelphia Chapter A.S.M., was recently made manager of sales for the Hill-Chase & Co.

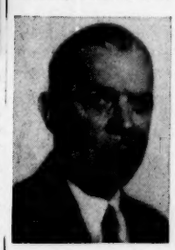
Mr. Moore's entire business life has been associated with the distribution of steels in the Philadelphia area since 1909. He was first associated with his father, and succeeded him after his death as local manager of the Halcomb Steel Co.

In 1920 he organized the Rupp-Moore Co., distributing tool and cold-finished steels. This business was continued until 1927 when he became district manager for the Columbia Steel and Shafting Co., and in 1929 took over additional duties as manager of Edgar T. Ward's Sons Co.

* * *

DIED

CHARLES A. MCCUNE, 61, a past president of the Philadelphia Chapter A.S.M., was recently made manager of sales for the Hill-Chase & Co.



C. A. McCune

Mr. McCune was first associated with his father, and succeeded him after his death as local manager of the Halcomb Steel Co.

In 1920 he organized the Rupp-Moore Co., distributing tool and cold-finished steels. This business was continued until 1927 when he became district manager for the Columbia Steel and Shafting Co., and in 1929 took over additional duties as manager of Edgar T. Ward's Sons Co.

Mr. McCune was research engineer and secretary of the Magnaflux Corp., New York, where he helped to develop the Magnaflux non-destructive testing method.

Mr. McCune attended Cooper Union and in 1900 became chief draftsman of the Safety Car Heating and Lighting Co. He was successively assistant engineer and chief engineer of the Commercial Acetylene Co., sales engineer of the Page Steel and Wire Co., director of research of the American Chain Co., and director of research of the Welding Engineering and Research Corp. until he joined Magnaflux in 1932.

Among his other achievements and inventions were a mantle system of acetylene car lighting, the development of arc welding electrodes, and cylinders for the storage and transportation of acetylene. He was the author of many books and papers.

* * *

A LONG standing member of the Detroit Chapter, HAROLD M. SPEARS, who for the last two years has been active in the affairs of the Saginaw Valley Group, died suddenly on Sept. 5.

Mr. Spears, who was 48, was manager of the Chevrolet Transmission Division of General Motors Corp. in Saginaw, Mich. On graduating from Albion College in 1917, he entered the employ of the Mason Motor Co. which was taken over by Chevrolet Motor Co. in 1918.

He has been with Chevrolet ever since, as metallurgist at Flint until 1924, as chief metallurgist in Detroit until 1934, as plant manager of Chevrolet Transmission in Toledo, and then as general superintendent when the plant was transferred to Saginaw, becoming manager in 1937.

* * *

SIR ROBERT HADFIELD, 82, baronet, internationally known engineer and metallurgist, and honorary member of the A.S.M., died in London on Sept. 30.

Best known for the development of the high manganese steel which bears his name, he also helped to develop silicon steels and many other alloy steels and metallurgical improvements. He was the author of numerous scientific works.

Portable Machine Demonstrates Tapping

By C. A. Barnett

Peoria Chapter held its first meeting on Sept. 9, when it was announced that Chairman J. R. Sommer of the Keystone Steel and Wire Co. had been transferred to Crawfordsville, Indiana. C. A. Davis, Jr. of the Caterpillar Tractor Co. was appointed by the Executive Committee to fill the vacancy as chairman, and Prof. H. C. Walker was appointed vice-chairman to fill the post vacated by Mr. Davis.

Herman Goldberg, inventor and vice-president of the R. G. Haskins Co., Chicago, then ably presented a very interesting discussion on taps and tapping.

Mr. Goldberg was aided in his presentation of the subject by a portable machine on which he demonstrated precision high speed tapping. The 150 members and guests present showed their appreciation with a very lively discussion period.

The second meeting was held on Sept. 23 with approximately 250 attending. R. S. Drummond, president of the National Broach and Machine Co., Detroit, presented a discussion on gears.

He had to aid him a generous display of gears, gear cutting tools, charts, and the blackboard. Mr. Drummond was very enthusiastically received.

Fishing Demonstrated for A.S.T.E., A.W.S. & A.S.M.

By K. Siems

Demonstration of "Plug Casting and Fly Casting" by E. E. Krieble and "Fishing Across Canada" by Courtney Riley Cooper, fishing editor of *Field and Trees Magazine*, were enticing subjects to about 130 members and friends of the Cincinnati chapters of the A.S.M., the American Society of Tool Engineers, and the American Welding Society, who held a joint meeting at the Cincinnati Yacht Club on the Ohio River, Thursday, Sept. 12.

The pictures were shown through the courtesy of the Canadian National Railway.

The temperature hovered in the low 50's, which might have been responsible for the fact that the Chapter was refunded on a half keg of beer.

Wanted

Leeds & Northrup instruments; controlling pyrometers, all makes; obsolete and defective types considered; parts also.

When appropriations are hard to get, use our offer for surplus and obsolete pyrometers to get new equipment.

Address Box 11-1
American Society for Metals
7301 Euclid Ave. Cleveland, Ohio

Steel Castings, High Speed Trains Hold Columbus Attention

By R. E. Christin

Columbus Chapter held its opening meeting of the 1940-41 season at the Fort Hayes Hotel on Sept. 10 with Dr. Clarence H. Lorig presiding as the newly elected chairman.

Following the dinner a sound slide film on "The Designing of Steel Castings" was shown by permission of the Steel Founders Society of America. W. W. Heimberger, of The Buckeye Steel Castings Co. of Columbus, assisted with an explanatory lecture preceding the showing of the film.

Here is a most instructive illustration for any group of engineers. It was demonstrated that the five sections important to all designs for steel castings resemble the letters L, T, Y, X, V.

Solutions for avoiding hot spots were suggested. Generous use of radii, tapers and cored holes in their proper locations, vertical versus horizontal tapers, chaplets, raised or stamped letters for identity, cast weld construction and gamma ray tests were some of the points discussed.

Following the coffee talk, A. M. Unger, development engineer of the Pullman-Standard Car Mfg. Co., Chicago, described the operations involved in the construction of the modern high speed trains.

Three types of cars were described, the aluminum alloy riveted car; alloy steel, girder type, spotwelded car; and alloy steel, truss type, arc welded car.

Movies and slides were shown of the production welding of passenger and freight cars. The movie on the freight car showed scenes of impact tests made in conjunction with A.A.R. research committee on a fully loaded, light weight, welded boxcar. Strain gages and cameras were used to record stresses and movements of car during impact.

One of the problems presented in railroad car construction was the special K-section truss necessary on the sides because of the windows.

Positions Open

YOUNG METALLURGICAL or mechanical engineering graduate for general and research machinability work on stainless steels. Some experience in operation of machine tools desired. Must be willing to go through extensive training period. Give experience and training. Box 11-10.

YOUNG GRADUATE METALLURGIST with practical knowledge of the processing of stainless steels. Should be competent in metallography and experienced in the investigation of metallurgical problems of stainless steels in production and in the field. Give experience and training. Box 11-15.

Address Box Number
American Society for Metals
7301 Euclid Ave. Cleveland, Ohio

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of THE REVIEW, published monthly except July and September at Cleveland, Ohio, for October 1, 1940, State of Ohio, County of Cuyahoga, ss. Before me, a Notary Public, in and for the State and county aforesaid, personally appeared Ray T. Bayless, who, having been duly sworn according to law, deposes and says that he is the Editor of THE REVIEW of the American Society for Metals, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations to wit:

1.—That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Society for Metals, 7301 Euclid Ave., Cleveland, O.; Editor, Ray T. Bayless, 7301 Euclid Ave., Cleveland, O.; Managing Editor, M. R. Hyslop, 7301 Euclid Ave., Cleveland, O.; Business Manager, Ray T. Bayless, 7301 Euclid Ave., Cleveland, O.

2.—That the owner is: The American Society for Metals, 7301 Euclid Ave., Cleveland, O., which is an educational institution, the officers being: President, James P. Gill; Vice-President, Oscar E. Harder; Treasurer, Kent R. Van Horn; Secretary, W. H. Eisenman; Trustees: F. B. Foley, D. S. Clark, H. J. French, M. A. Grossmann, W. P. Woodside. All officers as above, 7301 Euclid Ave., Cleveland, Ohio.

3.—That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4.—That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

Ray T. Bayless, Editor.

Sworn to and subscribed before me this 2nd day of October, 1940.
(Seal) Arthur T. Wehrle, Notary Public. (My commission expires Jan. 20, 1941.)

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1333 F. Street, N. W.

CHAPTER CALENDAR

CHAPTER	DATE	PLACE	SPEAKER	SUBJECT
Boston	Dec. 6	M.I.T. Room 6-120	W. E. Benninghoff	Induction Hardening
Buffalo	Dec. 12		James P. Gill	Recent Developments in Tool Steels
Calumet	Dec. 17	Woodmar Country Club, Hammond, Ind.	H. S. Van Vleet	Protective Coatings on Steels
Canton-Mass.	Dec. 12		M. L. Poole	The Cyclotron and Modern Alchemy
Chicago	Dec. 12	Towers Club	G. R. Brophy	Some Interesting Steel Investigations
Cleveland	Dec. 2	Cleveland Club	E. S. Davenport	Isothermal and Cooling Transformation in Steels
Dayton	Dec. 11	Engineers Club	O. E. Harder W. H. Eisenman	National Officers Night
Detroit	Dec. 9			Christmas Party
Hartford	Dec. 10			Christmas Party
Indianapolis	Dec. 16	Washington Hotel	J. D. Zalser	Modern Bronze Alloy Production (Color Film & Talk)
Lehigh Valley	Dec. 6	Hotel Traylor, Allentown, Pa.	C. H. Jennings	Recent Developments in Electric Welding
Los Angeles	Nov.		Norris Pendleton	Small Tool Manufacturing
Milwaukee	Dec. 17	Athletic Club	C. A. Zapffe	Hydrogen in Steel and Cast Iron and Defects in Applied Coatings
Montreal	Dec. 2	Windsor Hotel	A. Van Winsen	Metallizing
New Haven	Nov. 21	Derby, Conn.	A. B. Wilson	Heat Treating and Forging Practices
New Haven	Dec. 12	Hotel Barnum, Bridgeport, Conn.	Allan Morris	Corrosion of Copper and Copper Alloys
New Haven	Dec. 20	Seven Gables Inn, Milford, Conn.		Christmas Party
New York	Dec. 9		Representative of U. S. Dept. of Labor	Apprenticeship
North West	Dec. 18	Coffman Memorial Union, Univ. of Minn.	Mario Martelliotti	Machinability
Notre Dame	Dec. 11	Engineering Auditorium, University of Notre Dame	F. B. Doane	Magnaflux Inspection
Ontario	Dec. 6	Royal York Hotel, Toronto		
Penn State	Dec. 12	Mineral Industries Bldg., Room 121	W. L. Cook	Human Relations in Industry
Peoria	Dec. 9		S. M. Weckstein	Design, Manufacture and Application of Timken Tapered Roller Bearings
Philadelphia	Nov. 29	Engineers Club	O. E. Harder	Physical Metallurgy of Bearing Metals
Philadelphia	Dec. 13			Christmas Party
Pittsburgh	Dec. 12	Roosevelt Hotel		Christmas Party
Puget Sound	Dec. 4	Seattle, Wash.		Field Trip through Bethlehem Steel Plant
Rhode Island	Dec. 4	Providence Engineering Society	Hugh E. Replogle	Selection, Heat Treatment and Design of Metal Working Dies
Rochester	Dec. 9	Todd Union, Univ. of Rochester	Clement Batcheller	The Coloron Process
Rockford	Nov. 27	Elks Club		Round Table Discussion
Rocky Mtn.	Dec. 20	Oxford Hotel, Denver	M. A. Grossmann	Hardenability
Saginaw Val. Group	Dec. 6	Frankenmuth, Mich.		Stag Party
Schenectady	Nov. 26		V. N. Krivobok	
Springfield	Dec. 16	Hotel Sheraton	J. R. Townsend	Tools for Testing—Their Interpretation and Correlation
Syracuse	Dec. 3	Onondaga Hotel	V. T. Malcolm	Metals at Elevated Temperatures
Toledo Group	Dec.			Dinner and Hockey Game or Ice Follies
Tri-City	Dec. 10	Hotel Fort Armstrong, Rock Island, Ill.	E. V. Crane	Plastic Working
Washington	Dec. 9	National Bureau of Standards Auditorium.	Paul Field	Welding of Materials Used in Shipbuilding from the Metallurgist's Viewpoint
Worcester	Dec. 9	Worcester Boys' Trade School	Walter B. Dennen	Scope of the School
York	Dec. 11		E. I. Larsen	Resistance Welding